16869B-081000U-5 George B. F. Yee, Reg. No. 37,478 Telephone: 650-326-2400 Inventor Shoji Kodama Title: Method and Apparatus for File Replication with a Common Format Sheets of drawings 1 of 12

0101a 0101b NFS/ NFS/ **CIFS CIFS** Client Client 0104 LAN 0102 0103 **NAS Gateway** App Server 0105 0107 0106 SAN **Primary** Secondary Disk Array Disk Array 0106a 0107a **Proprietary Proprietary** Format Format

Fig. 1 (prior art)

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0101a 0101b NFS/ NFS/ **CIFS CIFS** Client Client 0103 LAN 0102 0103a 0104 **NAS Gateway** 0104b 0103b NFS/CIFS Server App Server 0103c VFS Layer VFS Layer 0103d Second File System **Replication Module First** Second File System File System 0105 0104d 0107 0103e SAN 0106 **Primary** Secondary Disk Array Disk Array 0106a 0107a

Fig. 2

2nd File Format

1st File

Format

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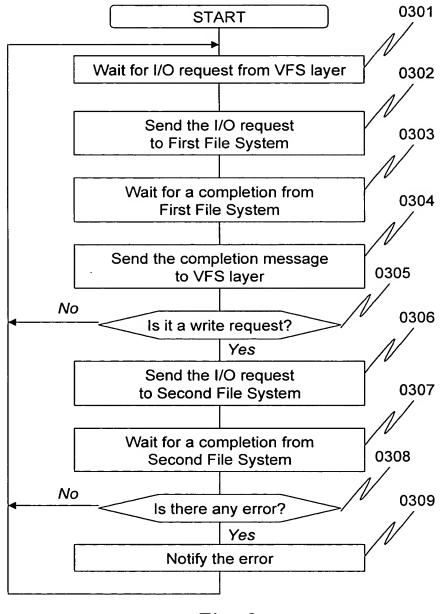


Fig. 3

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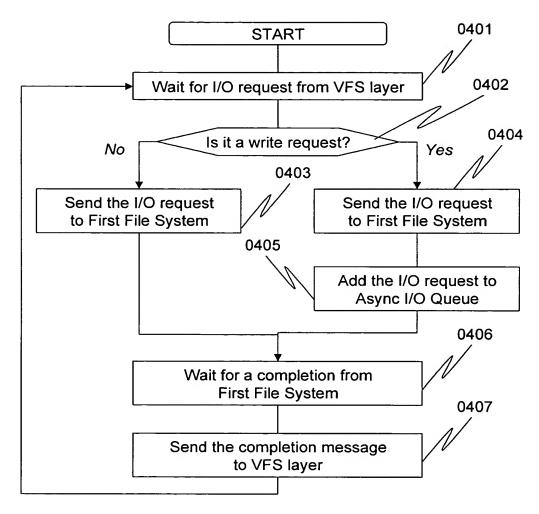


Fig. 4

Common Format
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START 0501 No Is any request in Async I/O Queue? 0502 Yes Send the I/O request to Second File System 0503 Wait for a completion from Second File System 0504 No Is there any error? 0505 Yes Notify the error

Fig. 5

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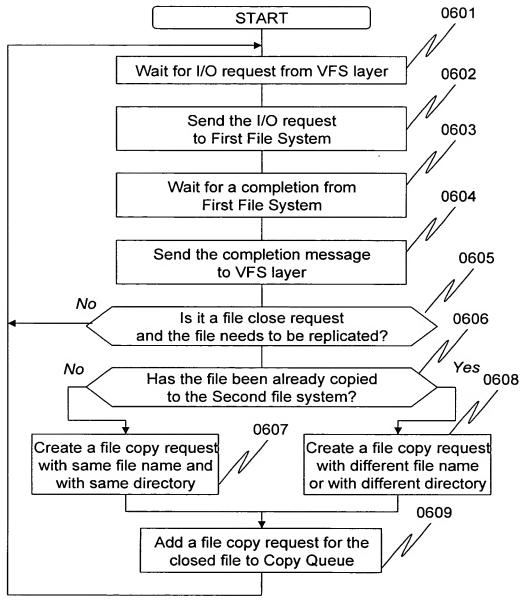


Fig. 6

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START 0701 No Is any file copy request in Copy Queue? 0702 Yes Copy a file specified in the request from the First file system to the Second file system 0703 Clear a file copy bit in attributes of the file 0704 No Is there any error? 0705 Yes Notify the error

Fig. 7

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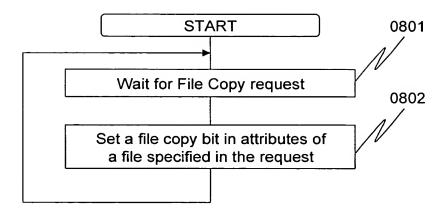


Fig. 8

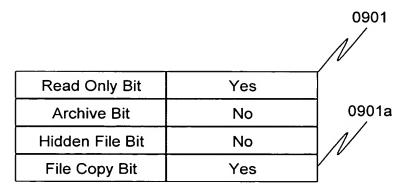


Fig. 9

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Async I/O Queue 1002a 1002a 1002b Request Next Next Next Next Next Next Fig. 10

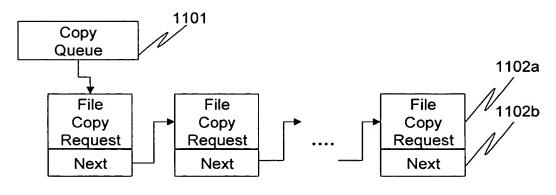


Fig. 11

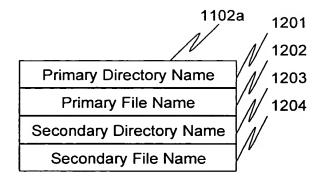


Fig. 12

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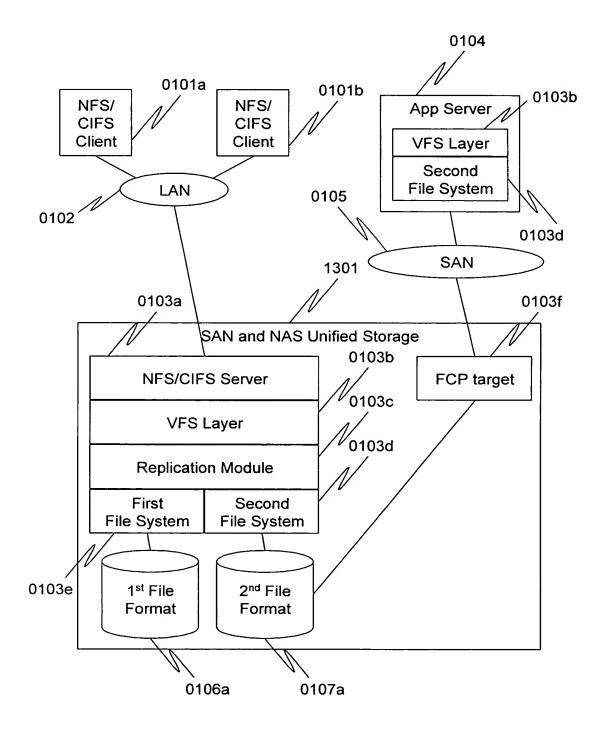


Fig. 13

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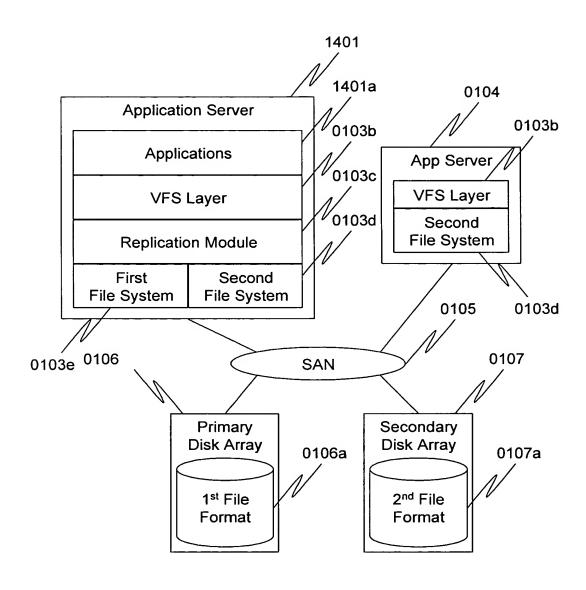


Fig. 14

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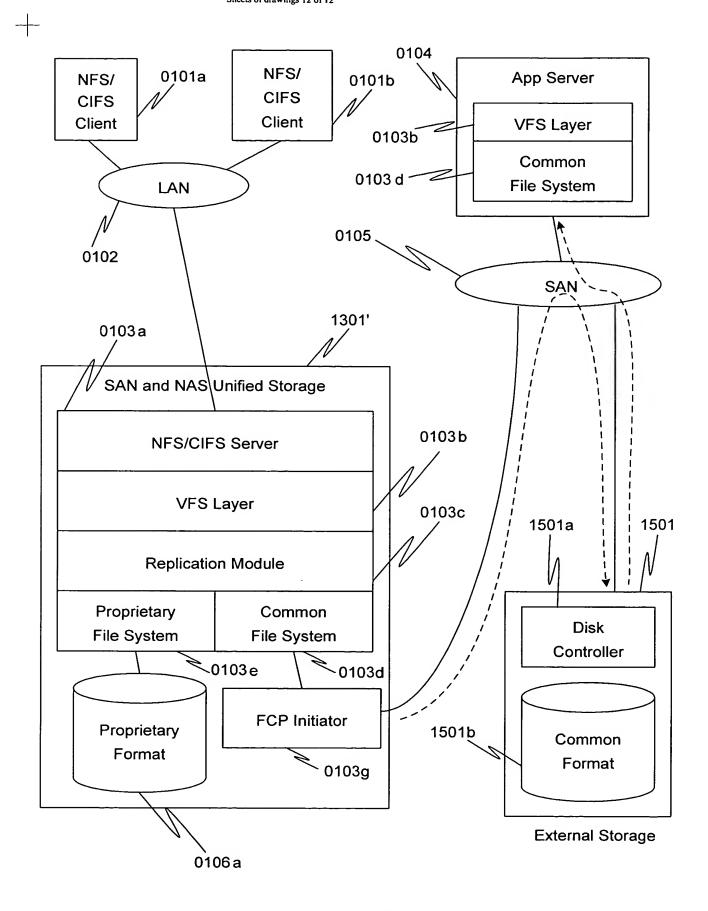


Fig. 15